1895MNRAS..55..150.

Mean Areas and Heliographic Latitudes of Sun-spots in the year 1892, deduced from Photographs taken at the Royal Observatory, Greenwich, at Dehra Dûn (India), and in Mauritius.

(*Communicated by the Astronomer Royal.*)

The results here given are in continuation of those printed in the *Monthly Notices*, vol. liv., p. 130, and are deduced from the measurements of solar photographs taken at the Royal Observatory, Greenwich, at Dehra Dûn, India, and at the Royal Alfred Observatory, Mauritius.

Table I. gives the mean daily areas of umbræ, whole spots, and faculæ for each synodic rotation of the Sun in 1892, and Table II. gives the same particulars for the entire year 1892 and for the three preceding years for the sake of comparison. The areas are given in two forms. First, projected areas—that is to say, as seen and measured on the photographs—these being expressed in millionths of the Sun's apparent disc; and next, areas as corrected for foreshortening, the areas in this case being expressed in millionths of the Sun's visible hemisphere.

Table III. exhibits for each rotation in 1892 the mean daily area of whole spots, and the mean heliographic latitude of the spotted area, for spots north and for spots south of the equator, together with the mean heliographic latitude of the entire spotted area, and the mean distance from the equator of all spots; and Table IV. gives the same information for the year as a whole, similar results for 1889, 1890, and 1891 being added as in the case of Table II. Tables II. and IV. are thus in continuation of the similar tables for the years 1874 to 1888 on pp. 381 and 382 of vol. xlix. of the *Monthly Notices.*

The rotations in Table I. and Table III. are numbered in continuance of Carrington's series ("Observations of Solar Spots made at Redhill," by R. C. Carrington, F.R.S.), No. 1 being the rotation commencing 1853 November 9. The assumed prime meridian is that which passed through the ascending node at mean noon on 1854 January 1, and the assumed period of the Sun's sidereal rotation is 25·38 days. The dates of the commencement of the rotations are given in Greenwich Civil Time, reckoning from mean midnight.

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TABLE I.

No. of Rotation.	Date of Commencement of each Rotation.	No. of Days on which Photographs were taken.	Umbræ.	Projected Whole Spots.	Mean of Daily Areas. Faculæ.	Corrected for Foreshortening. Umbræ.	Whole Spots.	Faculæ.
512	1892 Jan. 7·64	27	236	1430	2899	195	1224	2997
513	Feb. 3·98	24	397	2436	2954	296	1939	3088
514	Mar. 2·32	27	178	1076	3053	141	843	3143
515	Mar. 29·63	27	167	1071	3275	118	800	3264
516	Apr. 25·89	27	283	1751	3964	206	1361	3931
517	May 23·12	27	260	1786	3213	184	1318	3336
518	June 19·32	28	432	2675	3341	323	2042	3520
519	July 16·52	27	361	2181	3062	260	1640	3049
520	Aug. 12·74	27	207	1390	2790	146	1024	2889
521	Sept. 8·99	28	233	1577	3657	160	1154	2698
522	Oct. 6·27	27	167	1044	3696	121	782	3751
523	Nov. 2·56	27	222	1222	3285	155	924	3152
524	Nov. 29·87	27	177	1140	3273	123	847	3176

TABLE II.

Year.	No. of Days on which Photographs were taken.	Umbræ.	Projected Whole Spots.	Mean of Daily Areas. Faculæ.	Corrected for Foreshortening. Umbræ.	Whole Spots.	Faculæ.
1889	360	17·9	103	107	13·1	78·0	131
1890	361	21·3	133	273	15·5	99·4	304
1891	363	120	745	1322	86·2	569	1412
1892	362	255	1596	3230	186	1214	3270

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TABLE III.

No. of Rotation.	Date of Commencement of each Rotation.	No. of Days on which Photographs were taken.	Spots North of the Equator. Mean of Daily Areas.	Spots North of the Equator. Mean Heliographic Latitude.	Spots South of the Equator. Mean of Daily Areas.	Spots South of the Equator. Mean Heliographic Latitude.	Mean Heliographic Latitude of Entire Spotted Area.	Mean Distance from Equator of all Spots.
512	1892 Jan. 7·64	27	636	+21°·99	587	−19°·09	+ 2°·28	20°·60
513	Feb. 3·98	24	514	17·55	1425	26·86	−15·09	24·39
514	Mar. 2·32	27	401	21·66	442	23·01	− 1·79	22·37
515	Mar. 29·63	27	394	13·87	406	19·54	− 3·08	16·75
516	Apr. 25·89	27	530	15·00	831	17·01	− 4·55	16·23
517	May 23·12	27	657	13·12	661	19·73	− 3·35	16·43
518	June 19·32	28	1356	13·73	686	27·89	− 0·22	18·49
519	July 16·52	27	1019	12·50	621	20·72	− 0·07	15·61
520	Aug. 12·74	27	702	14·97	322	19·55	+ 4·11	16·41
521	Sept. 8·99	28	632	12·52	522	20·50	− 2·40	16·12
522	Oct. 6·27	27	348	13·31	435	22·21	− 6·42	18·26
523	Nov. 2·56	27	334	13·25	591	21·20	− 8·77	18·33
524	Nov. 29·87	27	361	+14·39	486	−17·29	− 3·78	16·05

TABLE IV.

Year.	No. of Days on which Photographs were taken.	Spots North of the Equator. Mean of Daily Areas.	Spots North of the Equator. Mean Heliographic Latitude.	Spots South of the Equator. Mean of Daily Areas.	Spots South of the Equator. Mean Heliographic Latitude.	Mean Heliographic Latitude of Entire Spotted Area.	Mean Distance from Equator of all Spots.
1889	360	5·0	+ 7°·26	73·0	−11°·90	−10°·68	11°·61
1890	361	53·1	+22·20	46·3	−21·75	+ 1·73	21·99
1891	363	401	+20·49	169	−19·91	+ 8·52	20·31
1892	362	607	+15·09	607	−21·69	− 3·29	18·39

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The principal features of the Sun-spot record for 1892 as brought out by the above tables are :

(1) The continued increase in the mean daily area of umbræ, whole spots, and faculæ. The rate of increase was indeed not so great as in 1891, but the mean values were in each case more than double those for 1891, in the case of the faculæ considerably more than double. (2) The mean daily areas for both whole spots and faculæ already exceeded those in the maximum years of the last solar cycle. (3) And this though the high latitude still occupied by the great majority of the spots would seem to indicate that the maximum had not yet been attained. (4) The predominance of the spots in the northern hemisphere has ceased, the mean daily area of spots being precisely equal for the two hemispheres. (5) Whilst the two hemispheres have shown an equality of spotted area, they have shown a curious difference in its distribution. In the northern hemisphere there has been a marked decline in the mean latitude, and the spots there have almost reached the zone of the period of maximum. In the southern hemisphere, on the contrary, the movement has been actually away from the equator. The rate of increase in the mean daily spotted area has also been very much greater for the southern hemisphere than for the northern. (6) The very remarkable increase in the area of the faculæ. The increase of 1891 over 1890 was at a lower rate for the faculæ than for the spots. This condition has been reversed for 1892, and the mean daily area for faculæ exceeds that of 1882, the maximum year of the last cycle, by considerably more than 1000 millionths.

Royal Observatory, Greenwich :
1895 *January* 8.

1895MNRAS..55..150.

Observations of Occultations of Stars by the Moon, and of Phenomena of Jupiter's Satellites, made at the Royal Observatory, Greenwich, in the year 1894.

(Communicated by the Astronomer Royal.)

Occultations of Stars by the Moon.

Day.			Phenomenon.		Telescope.	Power.	Moon's limb.	Mean Solar Time of Observation.			Observer.
								h	m	s	
1894	Jan.	12	Disapp.	24 Piscium	E. Equat.	55	Dark	7	1	38·81	C. D.
		20	,,	c Geminorum	,,	200	,,	11	9	38·69	B.
	Feb.	13	,,	36 Tauri	Astrographic Equat.	225	,,	12	38	24·34	H. F.
		13	,,	36 Tauri	E. Equat.	200	,,	12	38	24·29	W. B.
	Mar.	16 (*a*)	,,	ω^2 Cancri	,,	55	,,	12	3	1·82	D.
		16 (*b*)	,,	ω^2 Cancri	Altaz.	100	,,	12	3	0·79	H.
		23 (*a*)	Reapp.	Piazzi XIII. 317	E. Equat.	100	,,	15	0	55·12	A. C.
		25 (*a*)	,,	2 Scorpii	,,	100	,,	15	51	52·21	A. C.
		25 (*a*)	,,	3 Scorpii	,,	100	,,	16	19	2·98	A. C.
	Apr.	9	Disapp.	χ^1 Tauri	Altaz.	100	,,	7	3	46·16	H.
		9	,,	χ^1 Tauri	E. Equat.	55	,,	7	3	44·99	A. C.
		9	,,	χ^1 Tauri	Astrographic Equat.	225		7	3	45·99	A. E.
		10	,,	Piazzi V. 136	E. Equat.	100		10	53	26·15	B.